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CMMI as an Improvement Enabler in (at least some!) Small Settings

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Agenda

Context/Preview

Pilot Process

Preliminary Conclusions





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Context/Preview





What We've Heard....

From multiple sources/venues, SEI hears the perception that “CMMI was built for large companies, we don’t think it will work in our small company”

Early work with CMMI in small settings reported at various conferences indicated that, with appropriate interpretation, CMMI could be useful

What we didn’t see in reported literature was either individual case studies or suggestions as to specific adaptations that would be necessary to use CMMI effectively in small settings

We found a government sponsor willing to fund pilots, whose supply chain includes many small companies



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Pilot Project Purpose

A joint project performed by the partnership between the SEI and US Army's AMRDEC SED to establish the technical feasibility of developing guidance and other special-purpose transition mechanisms to support adoption of CMMI by small and medium enterprises (SMEs)

SMEs defined as Huntsville companies with 25 to 250 Huntsville employees*

*We recognized that in some settings, 25 would be considered "medium", not small! This sizing was based on the local demographics of the companies in SED's supply chain





Pilot Project Goals

- ✓ Exercise at least 3 CMMI Process Areas in a small company
- ✓ Work with at least 2 companies
- ✓ Codify recommendations for how to package, sell, appraise, train, implement CMMI for SME's to extent reasonable based on our pilots
- ✓ Be able to articulate business case for small companies similar to those in HSV to adopt CMMI
- ✓ Generate "follow-on" path to extend initial pilots
- ✓ Present project results at SE2 2004 and the Annual CMMI User Technology Conference
- ✓ Provide SEI CMMI/SCAMPI projects w/appropriate change requests/feedback



Results Preview

Both pilot sites reported significant qualitative benefit from use of CMMI to improve the selected business areas; both are codifying quantitative benefits for their experience reports

Both companies agreed to participate in SCAMPI A appraisals at the end of the pilot

ASI: CL2 in PP, PMC, M&A; CL3 in OPF, OT

Cirrus: CL1 in PP, PMC, REQM

ASI is committed to continuing on with CMMI as a PI enabler; Cirrus is considering whether to pull back and concentrate on ISO 9001 in their manufacturing business area or to continue on with CMMI



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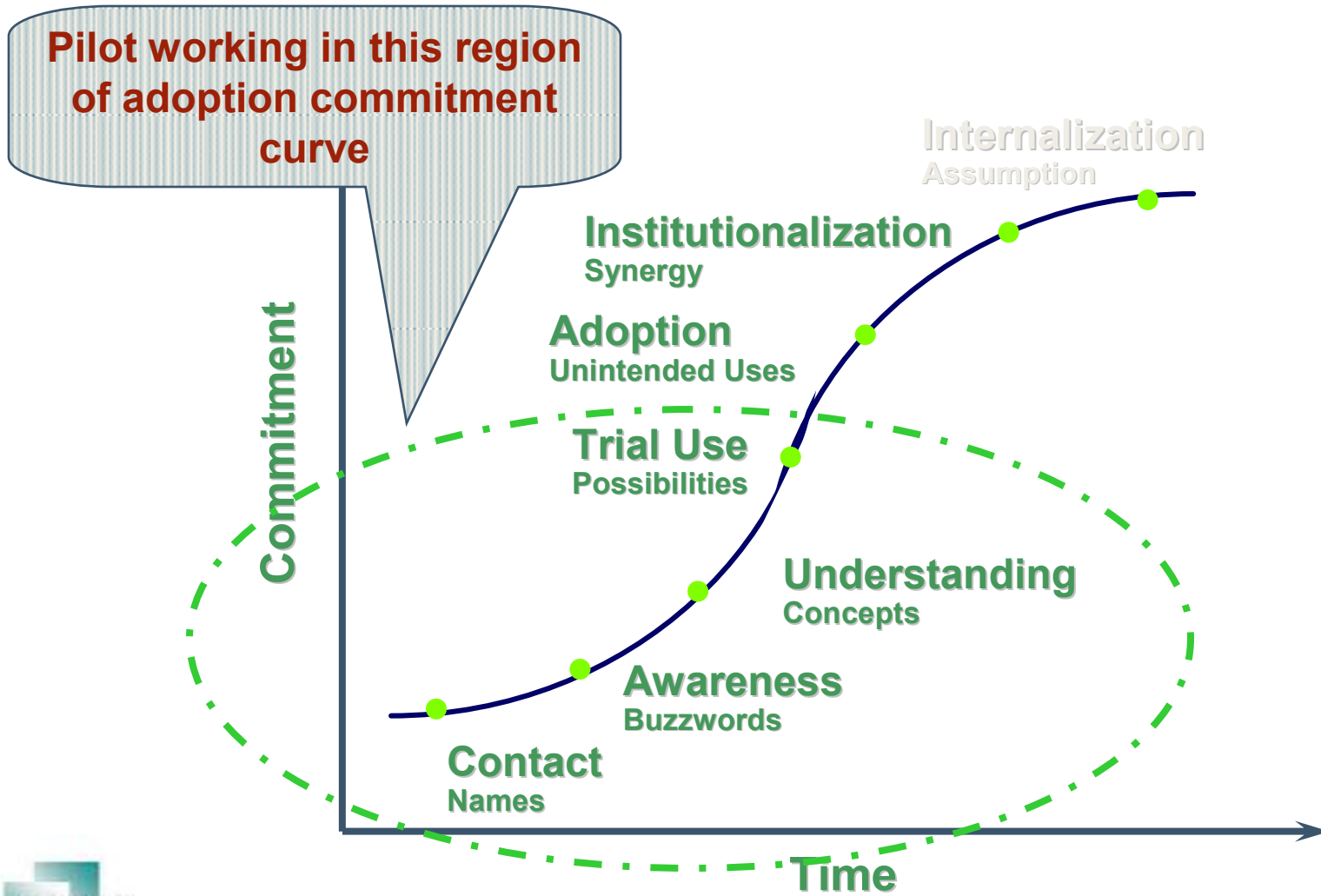


Pilot Process



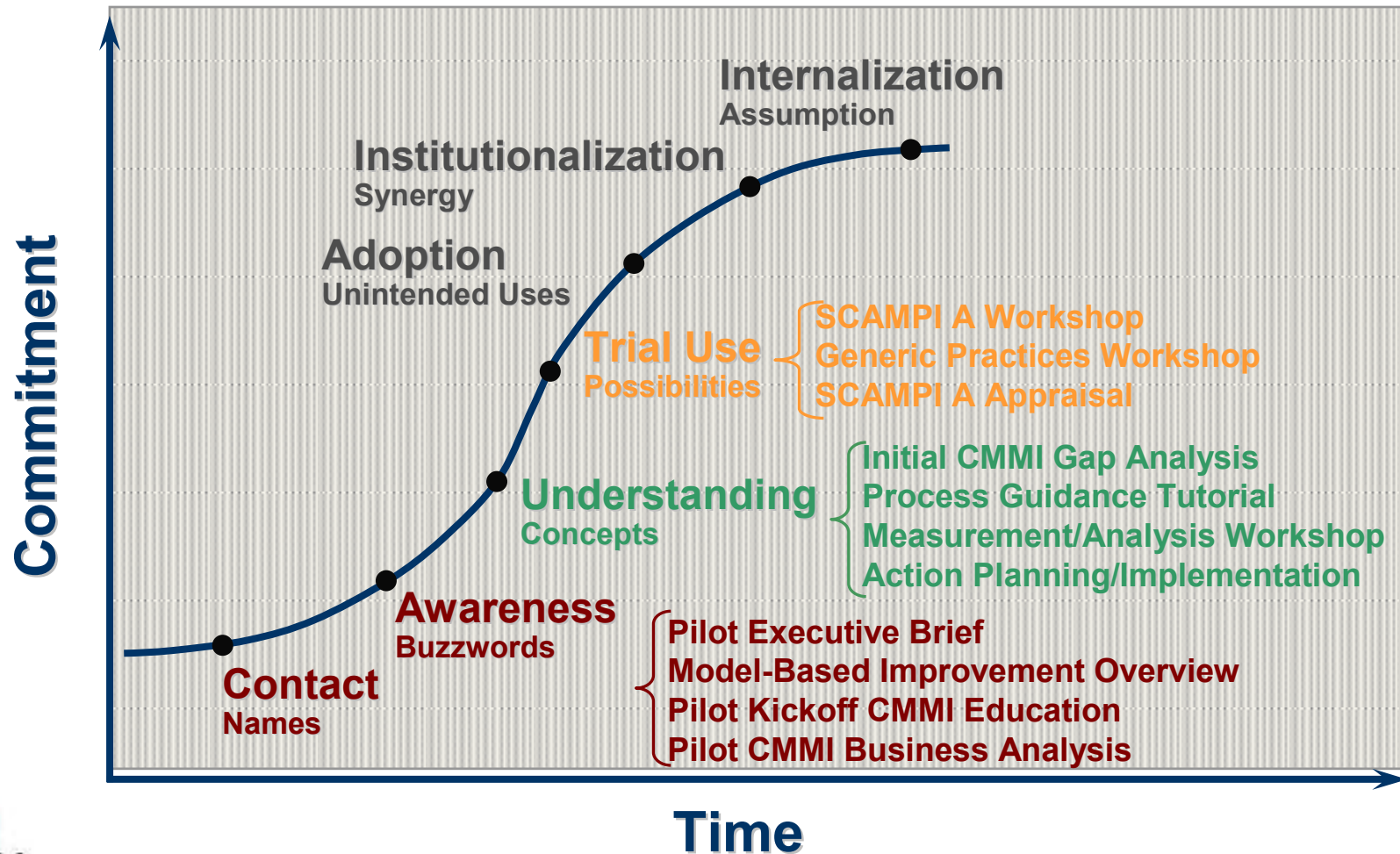


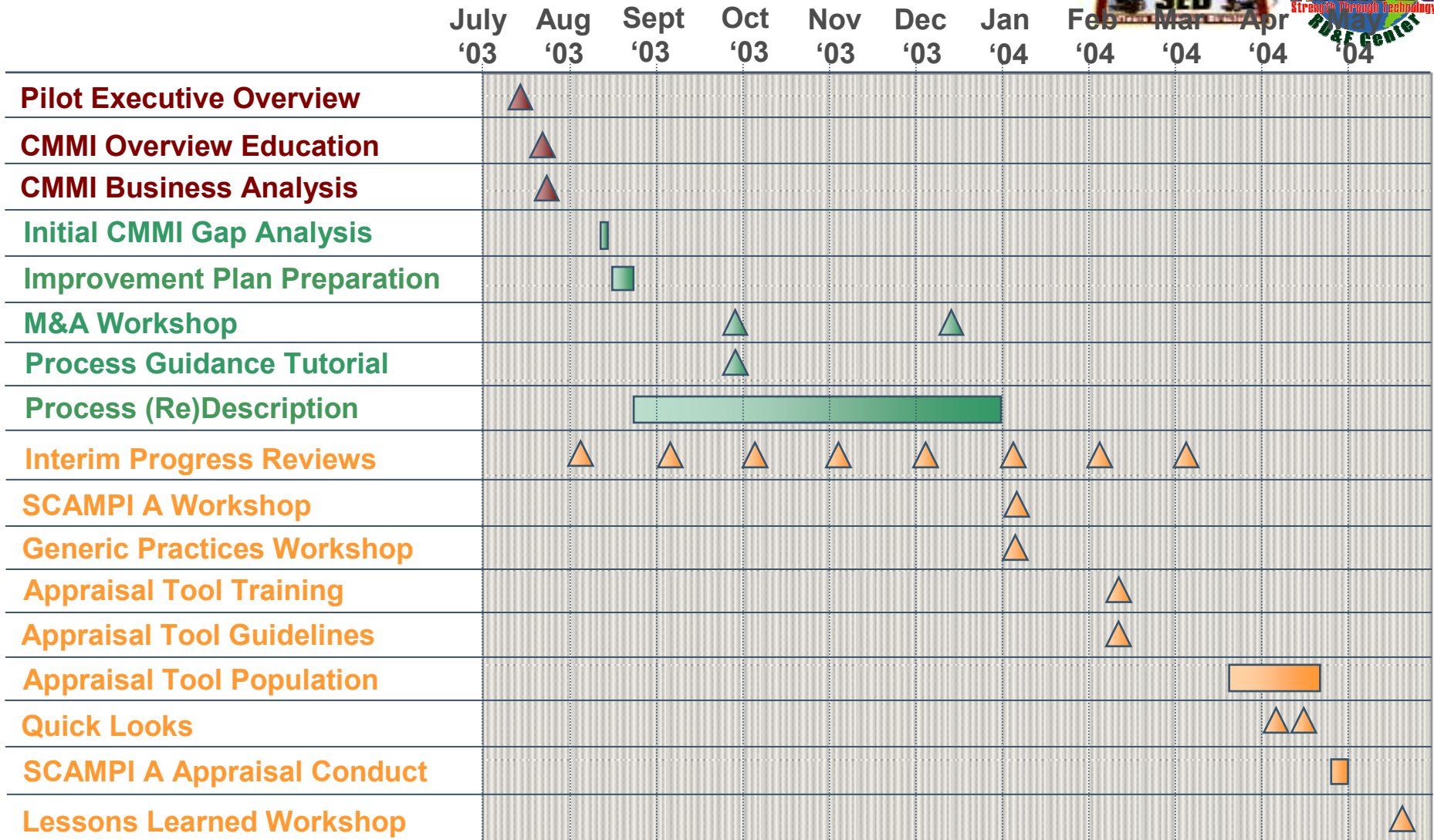
Basis of Pilot Process





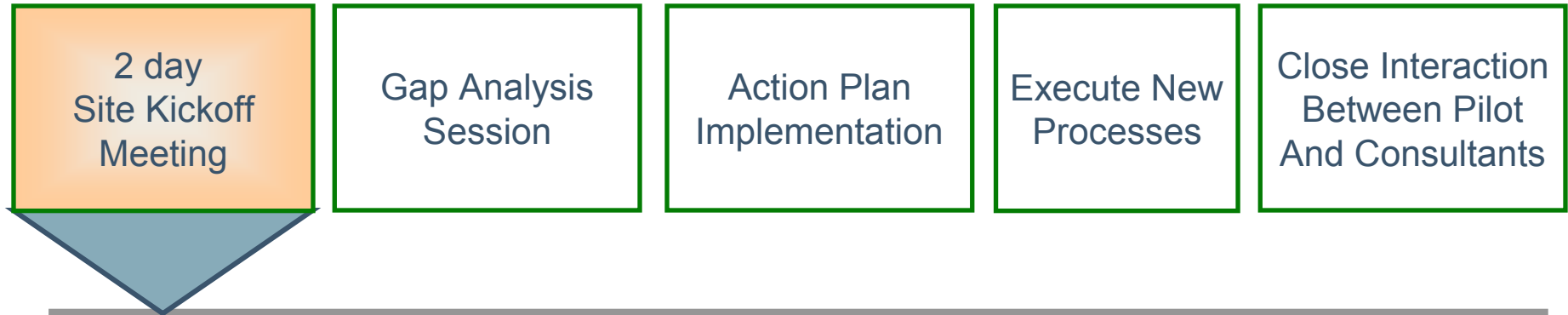
Summary of Materials Provided by Pilot







Pilot Activities July 2003-May 2004



- CMMI Overview Tutorial that covered Process Areas of Maturity Levels 2 & 3 and focused upon the typical business impacts related to the area
- Business Analysis to capture high impact/high need Process Areas
 - Had simple “thumbs-up” voting technique to determine level of impact/need
 - Also polled participants for the level of impact (H M L)
 - The high impact areas were obvious and it was easy to select the Process Areas to focus on for the pilot



Pilot Activities July 2003-May 2004



- 3 Process Areas were selected by the joint SED/SEI/Pilot Company team :
 - ASI: Project Planning, Requirements Management, Measurement & Analysis
 - Cirrus: Project Planning, Requirements Management, Project Monitoring & Control



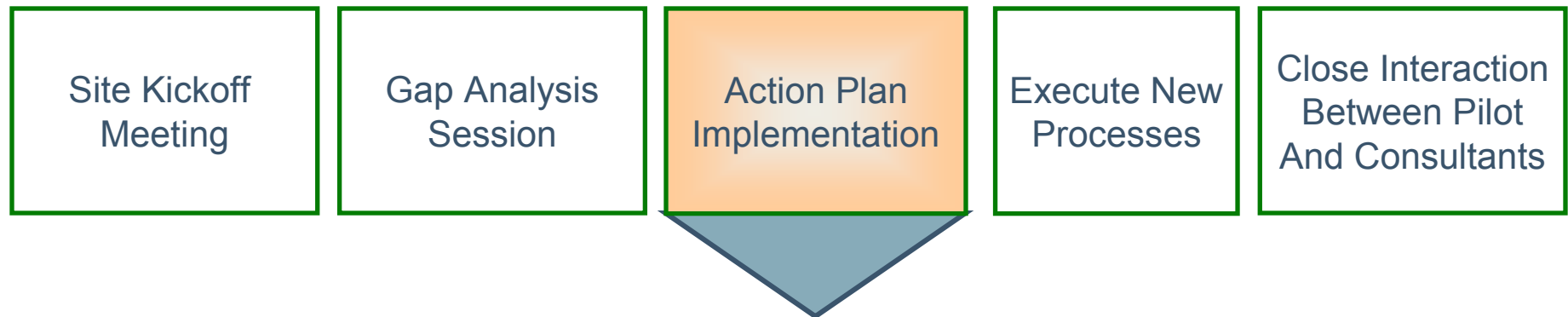
Pilot Activities July 2003-May 2004



- Workshop to analyze the process areas selected - the concepts/methods used for the SCAMPI B/C development project were adapted for this project:
 - Current practices documented and mapped to relevant CMMI model components
 - Interpretation of model intent for pilot's environment made and gaps documented, using PIIDs
 - Developed Action Plan for Pilot Team to address gaps found



Pilot Activities July 2003-May 2004



- Pilot Team Members developed Project-Specific Process Descriptions
 - Project Planning
 - Requirements Management
 - Measurement and Analysis
 - Project Monitoring & Control
- Companies evaluated impact at the organizational level and relationship to existing Quality Management Systems and ISO implementations



Pilot Activities July 2003-May 2004



- Baselined Process Descriptions
- Executed processes in Pilot Projects
- Collected metrics
- Gathered lessons learned (including benefits) and process improvements
- Updated processes to reflect process improvements
- Evaluated processes for standardization at the Organizational Level



Pilot Activities July 2003-May 2004



- 1 day monthly Face-to-Face sessions to status progress and get help/guidance from Consultants, for example:
 - Tutorial on writing process guidance documentation
 - Tutorial on business-oriented metrics
 - Tutorial on process capturing techniques
 - Consulting on CMMI institutionalization concepts
 - Feedback on Action Plans and Process Descriptions



Pilot Activities July 2003-May 2004



- Weekly teleconferences to keep the project progressing
 - Reviewed action items
 - Provided feedback on recently reviewed material
 - Provided guidance on any issues/problems encountered



Pilot Activities July 2003-May 2004

Appraise
Pilot
Projects

Share
Lessons
Learned

Publish
Pilot Results

- Prepared for SCAMPI-A Appraisal
 - Defined scope
 - Had regular preparation sessions with Lead Appraiser (short, but in addition to 1 day monthly team meetings)
 - Gathered objective evidence to support appraisal activities
 - Set expectations
- Conducted Appraisal
 - Trained Appraisal Team Members
 - Performed Readiness Review
 - Conducted On-Site appraisals



Current Pilot Activities

Appraise
Pilot
Projects

Share
Lessons
Learned

Publish
Pilot Results

- Pilot companies presented at Huntsville SE2 Conference
 - Half-day tutorial – March 29
 - Shared materials and activities conducted with ASI and Cirrus
 - Opportunity for each company to share their lessons learned
 - CMMI Panel – March 31
 - Provided Small Business Perspective for CMMI Implementation
 - Shared Lessons Learned
- SEPG Australia Keynote
- SEPG Latin America Tutorial segment
- NDIA conference presentations (this one, plus 4 others!)
- **SEPG 2005 and SSTC 2005 Presentations Planned**



Current Pilot Activities

Appraise
Pilot
Projects

Share
Lessons
Learned

Publish
Pilot Results

- Toolkit used here (i.e., tutorials, pilot processes) is hoped to jumpstart other small businesses in their process improvement activities-
Release planned 4th Quarter 2004
- Pilot Experience Reports:
 - One for each of the companies
 - Address process used, activities performed, and lessons learned
 - Other companies will be able to leverage from the experience report details
 - Releases planned 1st Quarter 2005



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Preliminary Study Conclusions



Challenges(1 of 2)

Affordability of implementation and appraisals is still a major concern even though technical feasibility is much clearer than before

Access to Process Improvement expertise is a significant challenge

Small Business *needs* to realize pay off quickly

Customer driven requirements are significant (de)motivator

Small businesses do not have staff dedicated solely to CMMI implementation – customer requirements take priority and can cause delays

Minimal infrastructure to leverage from in a small business



Challenges (2 of 2)

State of company quality systems have major impact on implementation effort, for good or ill

Just In Time Training is critical for small organizations.

“The customer rules” – Many small organizations adopt/adapt their business practices directly from their customers or primes

Model is easier to interpret for product development than for services – Small Businesses typically more service oriented



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On the Other Hand...

Less formal organizational structure means **fewer barriers** to “knock down”

Leadership involvement is quite accessible once the leader is committed

Once the leader is committed, **speed of changes** seems to be **faster** than in larger settings



Critical Success Factors

Business Impact Focus/Pilot Kickoff Workshop

SCAMPI B/C for *limited* # of PAs to get started

Limited consulting time (1 day/month)

Broad context and background of consulting team

Commitment of pilot companies' staff and leadership

Availability of most teaching materials in consultants' existing toolkits

Monitoring/Review of business impacts in process (anecdotal initially, moving to more quantitative as companies improve)



What Can the SEI Generalize from this Pilot?

Connecting the model to business problems provides initial motivation

- Both companies initially came in thinking about “going for ML3”
- Business analysis didn’t dissuade from that, but did help them to see “why” ML3 could be valuable internally as well as externally

Informative language in CMMI is where most of the “confusion factor” was for pilot companies

- When we went to the “mini-CMMIs” as a reference at one company, interpretation of SPs was actually easier for them than when using the larger book



Potential Generalizations-2

Translation of CMMI terminology to organizational context is challenging, but a valuable learning experience

- Similar issue to larger organizations using CMMI for the first time

Many of the issues in starting CMMI adoption in larger organizations are seen in the small companies

- The difference is the amount of resource the small companies have to spend (in terms of % of total resources) to solve them



What Next?

SEI is starting to connect with other researchers in the process improvement in small settings space:

- Through IPRC (International Process Research Consortium)
- ISSERC (Ireland)
- Griffiths University (Australia)
- ESI (Spain/SA)
- Fraunhofer Institute @ University of Maryland (US)
- “HUB” project in Brazil

We’re looking for others to share data/sponsor research in this area



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Summary

Initial results of pilot CMMI implementation in 2 small settings very positive

Informative components of the model provided more interpretation problems than the required or expected components

Using CMMI to help solve self-acknowledged business problems is important for gaining/sustaining leadership and staff commitment

Technical feasibility in the areas studied was established; affordability (especially for appraisals) is an issue only lightly addressed in the pilots



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